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EU fiscal framework reform:

Discretionary policy reaction to the cycle and the role of fiscal rules

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Abstract

European fiscal rules failed to dampen shocks and are often criticized for being too complex, not transparent and poorly enforced. Using EU country-level data, we find evidence of fiscal policy procyclicality for the key current fiscal framework indicator, the change in structural balance. We show that an alternative measure, the cyclically adjusted government spending growth rate, is more effective in activating a countercyclical fiscal response. Moreover, by simulating the bindingness of the new expenditure rule, we verify that it would have triggered a different course of action by EU member states, changing the EU fiscal history.

Keywords: Fiscal policy, Procyclicality, Countercyclicality, Expenditure rule

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1. Introduction

The current European fiscal framework is highly criticized, mainly because of its lack of transparency and simplicity (Feld et al., 2018) and due to the "poor functioning of the current fiscal rules", as addressed by Benassy-Quéré et al., 2018. Some authors (e.g. Darvas et al., 2018) argued that the existing framework is partly responsible for the fiscal austerity which followed the economic crisis.

Regardless multiple attempts of further fiscal coordination, the European Economic and Monetary Union (EMU) was not able neither to avoid the development of fiscal imbalances before the economic crisis (Andrle et al., 2015) nor to reduce the risks generated by the 2008 financial meltdown. This result conflicts with the literature, which states that fiscal rules should be more effective in a monetary union, where states cannot neither set their interest rates nor devaluate national currencies in order to stabilise the countries' debts (Barnes and Casey, 2019). The framework's failure can be motivated by two prominent results. Firstly, the debt sustainability of EU countries was not guaranteed by an appropriate fiscal discipline able to actively reduce the Member States' deficit biases (Claeys et. al, 2016). Secondly, the process of countercyclical fiscal policy was not activated, whereas procyclical measures exacerbated economic and social problems, negatively affecting public budgets, potential growth and unemployment (Darvas et al., 2018). As showed by Christofzik et al. (2018) and clearly explained by Darvas et al. (2018), the effects of procyclical fiscal rules can be observed in both periods: "in the expansion phase deficits and debt levels are not reduced as much as they should be despite fiscal multipliers are presumably lower and fiscal consolidation policies ought to be implemented, while in the recession phase fiscal consolidation plans cannot achieve their objectives, given the higher fiscal multipliers, and the public debt increases". Another drawback is related to the compliance of the rules by the single countries and their enforcement by the European and national fiscal authorities, which has largely proved to be ineffective.

In order to reform the European fiscal architecture and obtain more countercyclical, less complex and more enforceable fiscal rules, many "discipline and stabilisation improving" proposals (Benassy-Quéré et al., 2018) were presented. In this paper, we start by focusing on one of them, which received a large support among economists (Benassy-Quéré et al., 2018; Darvas et al., 2018): a new operational expenditure rule, illustrated by Ducoudré et al. (2018). To check if the history of the past years could have been different with the proposal already in place, a backward looking test on the compliance levels of both current and new fiscal rules is performed. In a second section, we empirically verify if the existing rule (based on the structural balance growth rate) acts in a procyclical way, and therefore it is unable to cushion shocks. Moreover, we evaluate if the considered expenditure rule or the use of alternative government budgetary aggregates would have strengthened the long-term debt sustainability by activating, on the medium term, a countercyclical reaction of the fiscal stance to the economic cycle.

The compliance results obtained from the simulation show that the new rule would have been enforced more than the existing one in the Euro Area. Using a comprehensive set of country-level data covering all European Union Members from 1999 to 2019, a country and time fixed-effect model of the fiscal impulse response to the change in the output gap is subsequently estimated. The fiscal impulse is calculated in different stages of the budgetary process and according to a set of different fiscal instruments, to confront their performances and determine which one is the most effective to counteract to the cycle. The results confirm a procyclical behaviour of the current rule and a countercyclical effect generated by the new expenditure rule, while the fiscal response activated by other government indicators is more ambiguous.

The paper observes the following structure: section 2 provides an overview of the current fiscal framework and presents a literature review of its structural weaknesses, proposing a new instrument to correct them. Section 3 simulates how binding the new rule would have been in the eventuality of its application and checks the compliance of the current rule. Section 4 defines

the methodology adopted for testing the fiscal policy reaction to the economic cycle. Consecutively, in section 5, the country-level data sources are presented along with the descriptive statistics of the variables used. Results obtained from the empirical analysis are reported in section 6, and followed by the conclusion.

2. The fiscal framework

2.1 The existing set-up: from 1997 to today

Since the ratification of the Treaty of Maastricht in 1992, the 3 percent headline deficit and the 60 percent debt-to-GDP ratio fiscal rules were designed to accomplish the objective of long-term debt sustainability (Christofzik et. al, 2018). They represent the first pillars of the European Union fiscal framework and were included in the Stability Growth Pact (SGP), introduced in 1997 to detect and correct excessive deficits of the EU Members. If both rules are met, the compliant country is under the "preventive arm", whose risk reduction purpose is to monitor that the Member State's discretionary policy doesn't affect negatively the other countries of the Union (European Court of Auditors, 2018). If at least one of the rules is breached, the country enters the "corrective arm", and an Excessive Deficit Procedure (EDP) is activated (Claeys et al., 2016).

Nevertheless, the procyclical action of this set of rules triggered the replacement of the headline deficit with the structural deficit in 2005 (Christofzik et al., 2018). The rationale of this switch was the elimination of the cyclical economic fluctuations from the headline deficit, ensuring legislators to identify those discretionary policies potentially conducive to fiscal stability. However, by removing the contemporaneous cyclical component, the structural deficit was no longer merely dependent on observable government revenues and expenditures. As a result, the measurement process of the cyclical adjustment factor became of crucial importance for obtaining unbiased budgetary balances estimations.

The financial crisis and its aftermath implied a call for "reinforcing economic policy coordination" (European Commission Communication, 2010), which brought to the launch of the "six-pack" reform, later integrated by the "two-pack", "aimed at strengthening budgetary surveillance" (European Fiscal Board, 2019). Three major changes to the framework resulted from it, designed to reduce procyclicality but at the expense of simplicity and transparency.

The first was the provision of a more precise debt reduction requirement, consisting in the decrease by at least 1/20th of the gap between the actual debt and the 60 percent debt-to-GDP ratio for Members whose debt is higher than the target. However, this prescription was not efficient for the attainment of the expected adjustment path, especially because flexibility was used in order to avoid opening an Excessive Deficit Procedure (Darvas et al., 2018).

The second concerns the creation of country-specific medium-term objectives (MTOs), conceived as fiscal devices to target the adjustment of the Members' structural budgetary positions needed in order to ensure their debt sustainability. Albeit the fiscal indicator is determined considering the debt levels of each Member State (structural deficit at or above 0.5 percent of GDP for countries with a debt-to-GDP ratio above 60 percent or at least 1 percent for those whose ratio is below the debt target), its fiscal risks and its economic actual status and development (European Commission Glossary), most of peripheral European countries experienced only a mild debt reduction, while some of them increased their debt-to-GDP ratios.

Finally, the third was the introduction of the expenditure benchmark, which is the maximum medium-term growth rate allowed of real public expenditure (deflated by the GDP deflator forecast), not taking into account discretionary revenue measures and consistent with the fulfilment of the other fiscal targets, in case a Member State's MTO is not attained (Council of the European Union, 2017). The rule added another element of complexity in the fiscal scheme and was designed to perform in a controlled scenario. It didn't consider the possible impact of a persistent demand shock such as the one experienced after the 2008 economic crisis, that may

induce pessimistic estimates of potential output (hysteresis effect), as outlined by Coibion et al. (2017).

2.2 The need for reform

Currently, as noted by Wieser (2018), the framework's lacking transparency and simplicity are caused by an heterogeneous system of coexisting national and supranational rules which are not implemented to the same degree, and worsened by the numerous exceptions and escape clauses that further limit the correct enforcement and compliance of the fiscal norms.

Furthermore, the estimation of the structural budget balance, that is the budget balance adjusted for the economic cycle component and excluding one-off fiscal measures, introduced by the Fiscal Compact in 2013 and whose change is considered as the reference fiscal indicator, is not observable and subject to large measurement errors. Usually the revision calculated on an annual base in the change of the structural balance is larger than 0.5 percent of potential GDP, meaning it is larger than the baseline yearly adjustment requirement for countries that violate EU fiscal rules, and much larger in period characterized by economic uncertainty. One of the main reasons of the structural budget balance real-time forecasts unpredictability is their dependency on output gap, known as the difference between actual output and potential output, whose estimates are highly questionable. Consequently, this instrument should be addressed as not reliable for policymaking support (Claeys et al., 2016) and must be replaced by a new pillar, that conversely embodies a set of traits apt to optimally implement the fiscal targeted objectives. In this regard, the new fiscal rule should consider fiscal variables that could be directly controlled by governments, whose estimates are less sensitive to ex-post revisions and more reliable as forecast errors are smaller and not widening when considering cyclically adjusted measures. Moreover, another fundamental feature of the instrument should be its ability to ensure the correct functioning of automatic stabilizers, in order to obtain an anti-cyclical fiscal policy which compensates the state of the business cycle (Christofzik et al., 2018).

A more suitable fiscal rule that could be adopted as the new cornerstone and not alter the entire structure of the current framework is, as suggested by large strand of the economic literature (e.g. Fabrizio and Mody, 2008 and Darvas and Kostyleva, 2011), a reformed version of the expenditure benchmark. All expenditure aggregates can be curbed by governments, and by deducting the cyclical adjustment components it is possible to isolate the residual which is not responsive to the cycle. An expenditure rule would therefore guarantee relatively smaller real-time forecast errors collected in an adjustment account and dispose of alpha and beta corrections, which are currently considered for the structural budget balance in consideration of potential output growth revisions and revenue windfalls (Christofzik et al., 2018). Indeed, as confirmed by Claeys et al. (2016), the revisions of the change in the structural balance estimates are much bigger than the ones of the medium-term average potential growth projections, used for the expenditure rule. Hence, endorsing what already argued by Anderson and Minarik (2006), more transparency and less susceptibility to manipulation is ought to be achieved. Lastly, automatic stabilisers are not restricted in the case of the expenditure rule, allowing to contain procyclical bias and to stabilise the fiscal accounts during downturns (Holm-Hadulla et al., 2012), while preventing the increase in debt and inflation during upswings.

2.3 The new expenditure rule

The proposal of a revised expenditure benchmark is based on the previous contributions of led Brück and Zwiener (2006), who pointed to the necessity of an expenditure rule supported by a medium term debt target as opposed to the current fiscal rule supervision made on an yearly basis, and of Andrle et al. (2015). Similarly, Ducoudré et al. (2018) suggested a rule which puts a ceiling to the growth rate of the cyclically adjusted expenditure aggregate, measured as the nominal public expenditure excluding interest payments, unemployment spending and one-off expenditure measures. As suggested by the authors, the fiscal variable should not grow faster than the nominal GDP (obtained as the sum of the potential real GDP and expected inflation),

ensuring a long term debt stabilization process and activating a short run potential countercyclicality of the fiscal policy. Moreover, public spending should increase with a slower pace for countries whose debt-to-GDP ratio is higher than 60 percent, those which should restructure their debts.

The expenditure rule can, thus, be expressed through the following formula:

$$\frac{G_{i,t} - G_{i,t-1}}{G_{i,t-1}} = \frac{\bar{Y}_t - \bar{Y}_{t-1}}{\bar{Y}_{t-1}} + \frac{P_t - P_{t-1}}{P_{t-1}} - \gamma\left(\frac{D_{t-1}}{Y_{t-1}} - 0{,}6\right) \leftrightarrow \dot{g}_{i,t} = \dot{p}_t + \dot{\bar{y}}_t - \gamma(d_{t-1} - 0{,}6) \quad (1)$$

where $G_{i,t}$ represents the cyclically adjusted public expenditure, $\bar{Y}_t$ indicates the potential GDP, $\dot{p}_t$ the expected inflation and D_t the gross public debt, while d_t is the debt-to-GDP ratio.

The public expenditure adjustment parameter γ changes on the basis of the distance of the Member's actual debt level from the public debt target, and it affects the speed of adjustment: the bigger the distance, the faster the speed. Incorporated as a country-specific debt correction mechanism, it would substitute the current 1/20th debt reduction rule. It is designed accordingly, for countries with high, medium and low debt-to-GDP ratios:

$$\gamma = 0{,}02 \text{ if } \frac{D_{t-1}}{Y_{t-1}} > 0{,}9;\ \gamma = 0{,}01 \text{ if } 0{,}6 < \frac{D_{t-1}}{Y_{t-1}} < 0{,}9;\ \gamma = 0 \text{ if } \frac{D_{t-1}}{Y_{t-1}} < 0{,}6 \quad (2)$$

The government control on the adjusted expenditure aggregate would be less difficult. Differently from the structural balance, the variable is not dependent on revenues, verified to be more positively correlated with the business cycle than expenditures by Christofzik et al. (2018), nor on unemployment and interest expenditures, with the latter particularly sensible to shifts in market sentiment (Claeys et al., 2016).

3. The test on fiscal rule bindingness and current fiscal compliance

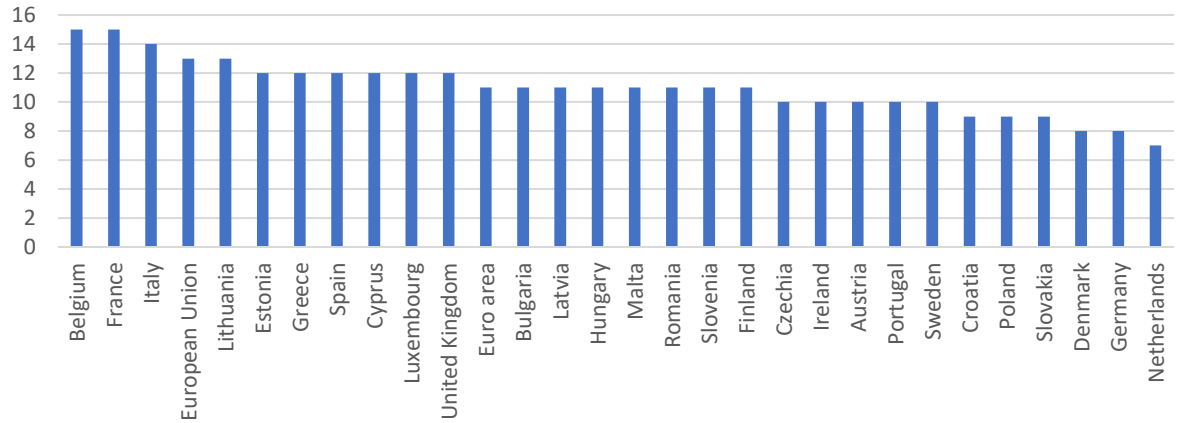
In the following section, taking as reference the proposal of Ducoudré et al. (2018) , a simulation of how binding the new expenditure rule would have been, if effectively enforced, is performed for EU Members over the period between 2002 and 2019. The aim is to check

whether and to what extent the new instrument would have forced governments to redefine their fiscal policy platforms, thereby allowing a change in the countries' procyclical fiscal stance behaviour and modifying the course of fiscal history in Europe. Besides, a test on the current MTO rule compliance is executed, in order to detect its actual level of enforcement.

3.1 Comparison between the new expenditure rule and the MTO rule

When analysing the difference between the actual cyclically adjusted nominal public expenditures and the ones recalculated by implementing the new expenditure rule, the empirical results show that the European Union would have breached the rule in 13 out of the past 18 years, meaning the fiscal rule would have been binding over 72 percent of the overall period. Consequently, if this indicator was adopted and its limits were met, EU Members' fiscal stances would have been more prudent, changing the course of EU. When considering the Euro Area, the percentage decreases to 61, corresponding to 11 out of the past 18 years. Overall, as showed by Figure 1, apart from the cases of Belgium, France and Italy, which report a higher number of non-compliant years (15 for Belgium and France, 14 for Italy), the remaining countries are below or correspond, as in the case of Lithuania, to the EU value.

Figure 1: Number of years deviating from new expenditure rule targets, 2002 to 2019

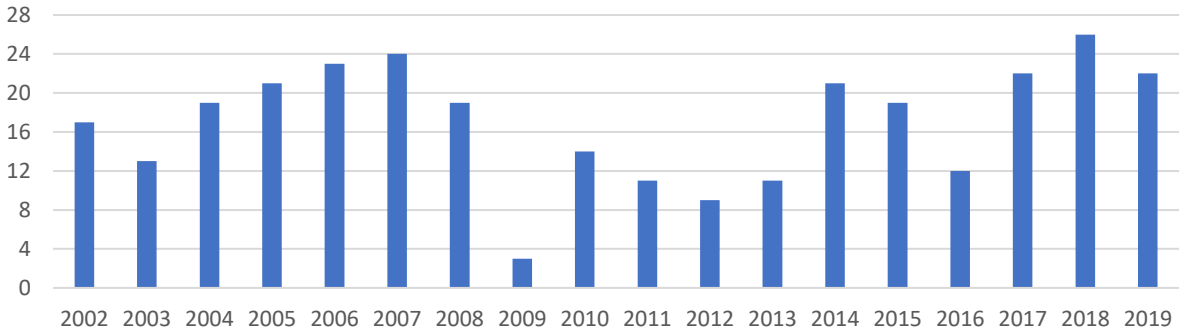


Source: Author's own calculations based on AMECO dataset
Notes: Accounted deviations occur when actual cyclically adjusted total expenditures are higher than their respective spending limits, determined following equations (1) and (2).

From an annual basis perspective, Figure 2 results suggest that after a period of government public spending expansion traced by an increase in the number of non-compliant countries, the

2008 financial crisis would have triggered a more spread adherence to the budgetary resources limits, followed by a further growth of the rule breaking Members in the last five years.

Figure 2: Number of countries deviating from new expenditure rule targets, 2002 to 2019



Source: Author's own calculations based on AMECO dataset
Notes: Accounted deviations occur when actual cyclically adjusted total expenditures are higher than their respective spending limits, determined following equations (1) and (2).

When the MTO compliance is taken into account, as showed by Table 1 considering the Euro Area (with the exemption of Greece) over the period from 2011 to 2018, it results that the current fiscal rule was respected only in 32 percent of the cases (46 out of 144). However, once the country-specific objectives were achieved, governments tried to accomplish their targets even in the following years (Kamps and Leiner-Killinger, 2019).

Table 1: Distance to country-specific MTOs, 2011 to 2018

	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	-4.5	-4.0	-3.8	-3.7	-3.0	-2.1	-1.3	-1.4
Germany	-0.6	0.4	0.8	1.6	1.6	1.6	2.0	1.7
Estonia	0.1	0.0	-0.6	0.0	0.0	-0.4	-0.7	-0.8
Ireland	-7.6	-6.0	-3.9	-3.6	-1.5	-0.3	0.4	-0.1
Spain	-6.3	-3.1	-1.7	-1.5	-2.4	-3.3	-3.0	-3.3
France	-5.0	-4.3	-3.4	-3.0	-2.3	-2.2	-1.7	-1.7
Italy	-3.3	-1.3	-0.7	-0.8	-0.6	-1.4	-1.7	-1.7
Cyprus	-4.9	-3.9	-0.7	3.3	1.7	1.2	1.4	0.8
Latvia	-1.1	0.1	-0.4	-0.1	-0.5	0.7	-0.2	-0.9
Lithuania	-3.8	-2.8	-0.9	-0.4	0.3	0.7	0.4	0.3
Luxembourg	1.1	2.1	2.3	1.4	1.1	2.3	2.3	1.3
Malta	-1.9	-2.7	-1.7	-2.6	-2.5	0.5	3.5	0.6
Netherlands	-2.9	-1.5	-0.2	0.1	-0.4	1.3	1.0	0.4
Austria	-2.6	-1.9	-1.3	-0.3	0.4	-0.4	-0.1	-0.3
Portugal	-6.2	-3.1	-2.6	-1.3	-1.8	-2.2	-1.4	-1.4
Slovenia	-4.5	-1.6	-1.2	-2.1	-1.3	-1.1	-0.9	-1.4
Slovakia	-4.2	-3.6	-1.1	-1.6	-1.7	-1.5	-0.5	-0.7
Finland	-1.3	-1.6	-0.6	-1.0	-0.4	-0.2	0.4	-0.3

Source: Kamps et al.(2019) calculations based on AMECO database (spring 2018 vintage)
Notes: Numbers refer to the distance of the structural balance from the country-specific MTO. Green and red cells refer to countries which respectively have or have not achieved their MTO. As explained in the European Commission Vade Mecum (2017), countries that have up to 0.2 percentage of points of distance to their MTO are also appraised as being at the MTO.

4. Methodology

4.1 Baseline model

The empirical strategy used in order to assess the reaction of fiscal policy to the economic cycle is based on Eyraud et. al (2017), which tests respectively the contribution of discretionary policy planning and implementation to fiscal procyclicality, by using the following regression specification, on the panel data sample of 28 EU countries from 1999 to 2019:

$$\Delta sb_{i,t} = \alpha_i + \beta_1 \Delta gap_{i,t} + \beta_2 debt_{i,t-1} + \beta_3 controls_{i,t} + FE_t + \varepsilon_{i,t} \quad (3)$$

where *i* and *t* denote countries and years, Δsb indicates the fiscal impulse, defined as the change in the structural balance as a percentage of potential GDP, and $debt_{t-1}$ represents the initial debt-to-GDP ratio. By controlling for the original debt level, the purpose is to seize an eventual policy response intended to ensure debt sustainability. Moreover, time and country fixed effects are included. Among the coefficients, β_1 is the most relevant since it defines if the fiscal policy is acyclical, procyclical or countercyclical. An acyclical discretionary fiscal policy is targeted by a statistically insignificant coefficient, while in case of statistical significance a negative coefficient involves a procyclical policy and a positive coefficient a countercyclical policy. Robust standard errors are obtained and clustered by country.

The regression model is run according to four settings. The first one is based on the fiscal impulse plans and the predicted variation in output gap, both reported by the Member countries governments at time t-1 and relative to time t. The second one relies on the fiscal impulse and variation in output gap Commission forecasts, following the same approach of the first setting: the estimated results are intended to be compared to the ones obtained using the first setting variables set in order to check whether the government plans were more optimistic, resulting in a higher policy procyclicality. The third one considers real-time fiscal impulse and variation in output gap, using outturns published in time t+1 and relative to time t. The fourth one contains historical ex post fiscal impulse and variation in output gap.

To test whether fiscal policy reacts to the cycle differently when considering government balances as dependent variables, one additional fixed effects regression specification is employed, following the same four settings approach of specification (3):

$$\Delta ggb_{i,t} = \alpha_i + \beta_1 \Delta gap_{i,t} + \beta_2 debt_{i,t-1} + \beta_3 controls_{i,t} + FE_t + \varepsilon_{i,t} \qquad (4)$$

where Δggb indicates the fiscal impulse, defined now as the change of general government balances (total general government balance, adjusted general government balance and primary balance).

The aim is to verify if, as suggested by the countercyclical results of Egert (2014) when considering the OECD countries sample, these fiscal indicators, which are more controllable by the national authorities, are able to guarantee the right functioning of automatic stabilizers and therefore react in a countercyclical way to the economic cycle.

Finally, the fiscal impulse response to the cycle is tested when the growth rate of the cyclically adjusted expenditure aggregate, the one proposed by the new expenditure rule, is taken into account as dependent variable. The analysis, even in this case, adheres to the same regression specifications used for the other fiscal instruments, but the economic interpretation of the elasticity coefficient is different: if β_1 in negative, in fact, this means that public spending is decreasing during upturns, implying a countercyclical fiscal policy response to the cycle.

4.2 Model extension accounting for the position along the cycle

To verify if fiscal policy procyclicality was observed along the cycle, an extension of the first specification is also presented:

$$\Delta sb_{i,t} = \alpha_i + \beta_1 \Delta gap_{i,t} D(\Delta gap_{i,t} > 0) + \beta_2 \Delta gap_{i,t} D(\Delta gap_{i,t} < 0) + \beta_3 debt_{i,t-1} + \beta_4 controls_{i,t} + FE_t + \varepsilon_{i,t} \qquad (5)$$

where two dummy variables for upturns and downturns are interacted with the variation in output gap: the interaction factors aim to analyse if the reaction of the policy to the economic cycle is asymmetrical. As coefficient β_1 in specifications (3) and (4), coefficients β_1 and β_2 of

specification (5) define the acyclicality, procyclicality or countercyclicality of the fiscal policy. Consequently, if β_1 is negative this means that during upswings, when the actual GDP growth is higher than the potential GDP growth, a fiscal expansion is implied by an increase in the output gap, generating a procyclical discretionary policy. Correspondingly, if β_2 is negative this involves that during downturns, when the actual GDP growth is lower than the potential GDP growth, a fiscal tightening is determined by a decrease in the output gap, always resulting in procyclicality. As reported by Balassone and Francese (2004), in the case of procyclical upturns and procyclical or acyclical downturns the policy response to the cycle produce a "deficit bias" as well as a disproportionate accumulation of debt.

Furthermore, following the approach of specification (5), a test of the asymmetrical response to the cycle of the fiscal policy measured by the government balances growth rates is performed:

$$\Delta ggb_{i,t} = \alpha_i + \beta_1 \Delta gap_{i,t} D(\Delta gap_{i,t} > 0) + \beta_2 \Delta gap_{i,t} D(\Delta gap_{i,t} < 0) + \beta_3 debt_{i,t-1} + \beta_4 controls_{i,t} + FE_t + \varepsilon_{i,t} \quad (6)$$

As in the baseline model, the meaning of the coefficients β_1 and β_2 is inverted if the discretionary policy reaction along the cycle is tested for the change in cyclically adjusted expenditures.

4.3 Robustness check

Differently from Eyraud et. al (2017), whose analysis sample is the Euro Area over the period 1999-2015, national political economy variables like presidential election years and political fractionalization are not used as controls since they have already proved not to alter the results. Therefore, international factors might play a more decisive role in explaining the procyclicality effects and could thereby be investigated further.

As a robustness check, in order to test whether the 2008 financial crisis could have been the trigger of the procyclicality bias, the period of fiscal consolidation between 2011 and 2013, which followed the stimulus of the years 2009 and 2010, is excluded. Other control variables whose significance and impact is tested are population growth, debt servicing, corresponding

to the interest payments-to-GDP ratio, trade openness, equivalent to imports and exports as a percentage of GDP, the size of the public sector, measured as the ratio of government consumption to GDP, the public investment-to-GDP ratio, as well as inflation and real GDP growth rates, to check whether an eventual inflation or demand shock can affect the reaction of the fiscal impulse to the cycle (Ducoudré et al., 2018). Lastly, real house price growth, measured by Eurostat house price index growth rate, is added as control in order to check whether and to which degree asset price cycles could affect fiscal impulse.

5. Data and variables

We use country-level data for all the Member States over the period between 1999 and 2019 from three different sources. The first one is the AMECO macroeconomic database, provided by the European Commission, containing both historical data as of 2020 valid for the ex-post regression model setting, and the AMECO archive, which stores previous AMECO vintages of data, from 2011 to 2019, and are employed for the real-time data regression setting. The second sources are the Stability and Convergence Programmes (SCPs), documents issued on an yearly basis by the single EU Members containing projections of the principal macroeconomic indicators aimed at measuring the country-specific fiscal path towards their Medium Term Objectives (European Court of Auditors, 2018). The third are the Commission services' assessment reports, which compare the latest government estimates with the Commission's Directorate-General for Economic and Financial Affairs (ECFIN) forecasts, published in the Commission Staff Working Documents (SDWs).

Following the Ducoudré et al. (2018) approach, overall rather than primary structural balances are employed in the analysis due to data availability. Regarding the ex-post regression setting, in the period between 1999 and 2009, when data of structural balances is absent in the AMECO database, the variable is substituted by the cyclically adjusted balance, which differently from the structural balance includes in its estimation one-off and temporary measures. Similarly, for

the real-time regression setting, over the period from 1999 to 2006 cyclically adjusted balance is considered in substitution of the structural balance since not reported in the SCPs and SWDs.

Table 2: Descriptive statistics for European Union country-level data, 1999 to 2019

Variable	Obs.	Mean	Median	Std. Dev.	Min	Max
Government plans (t|t-1)						
Structural balance growth	433	0.446	0.4	0.658	-1.3	5.3
General government balance growth	465	0.444	0.4	0.924	-8.3	5.3
General government balance net one-offs growth	329	0.526	0.5	0.972	-9.6	3.7
Primary balance growth	451	0.436	0.4	0.960	-8.2	5.5
Output gap growth	433	0.205	0.2	0.82	-4.0	3.0
Commission forecasts (t|t-1)						
Structural balance growth	382	0.074	0.1	0.611	-2.6	5.4
General government balance growth	402	0.133	0.2	0.793	-8.6	3.2
General government balance net one-offs growth	339	0.226	0.2	0.662	-5.2	2.8
Primary balance growth	387	0.124	0.1	0.958	-8.5	3.5
Output gap growth	397	0.266	0.3	0.933	-4.3	4.4
Actual, real-time (t|t+1)						
Structural balance growth	469	0.021	0.1	1.787	-9.7	10.4
General government balance growth	497	0.085	0.268	2.706	-19.923	19.395
General government balance net one-offs growth	402	0.114	0.397	1.91	-10.0	4.3
Primary balance growth	485	-0.001	0.1	2.709	-18.956	19.485
Output gap growth	473	0.059	0.337	2.624	-20.1	11.1
Actual, ex-post (t|2020)						
Structural balance growth	558	0.061	0.098	1.51	-5.392	7.147
General government balance growth	558	0.09	0.207	2.362	-18.235	19.218
General government balance net one-offs growth	252	0.598	0.481	1.003	-1.789	5.379
Primary balance growth	558	-0.003	0.073	2.368	-17.413	19.764
Cyclically adjusted expenditure growth	558	0.063	0.142	2.125	-18.462	18.656
Output gap growth	558	0.08	0.448	2.346	-16.36	6.466
Initial debt-to-GDP	559	57.445	52.024	33.378	3.766	181.21
Population growth	560	0.240	0.257	0.84	-2.571	3.554
Debt servicing	559	2.248	2.029	1.333	0.027	7.535
Openness	560	116.874	100.85	64.836	45.4	408.4
Inflation growth	560	2.48	1.957	3.814	-15.784	25.311
Real GDP growth	556	2.236	2.1	3.54	-14.3	24.0
Public sector size	559	19.723	19.326	2.82	12.007	27.935
Public investment-to-GDP	523	3.707	3.69	1.1	1.45	7.73
Real house price growth	495	2.595	2.5	8.567	-36.3	45.5

Source: Author's own calculations based on AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019), Eurostat (for Openness, Real GDP growth and Public investment)

Notes: Commission forecasts' variables are available only from 2004 to 2019. Changes in General government balances net one-offs are available only from 2005 to 2019 for the t|t-1 and t|t+1 settings, and from 2011 to 2019 for the t|2020 setting. Real house price growth is available only from 2001 to 2019.

In consideration of government balances, total general government balance is measured as the simple difference between total government revenues and expenditures, whereas the adjusted government balance aggregate is obtained by deducing by the former one-off measures. Primary balance corresponds instead to the government balance excluding interest payments on general government liabilities.

With respect to the expenditure rule specification, differently from the specifications using changes in structural balance and government balances, the data of the cyclically adjusted expenditure aggregate adopted in the relative regression model is only relative to the ex-post setting, because of the uneven calculation of the fiscal variable in the SCPs and SWDs. Indeed, the lack of homogeneity in the measurement approach wouldn't allow a proper comparability of the real-time and the planned estimations with the ex-post ones.

Concerning the calculation of expected inflation, the expected growth of GDP prices is preferred to the expected growth of consumer prices since, as noticed by Ducoudré et al. (2018), since the former is less volatile than the latter and the sustainability of government expenditures is normally computed by using the nominal potential output trajectory. Potential GDP growth rate real-time measure is preferred to ex post evaluation, in order to decrease the impact of forecast errors. Lastly, the change in house price index (HPI) as calculated by Eurostat is employed to obtain a more uniform measurement of the real house price growth.

6. Empirical results

6.1 Fiscal policy procyclicality in EU: a visual representation

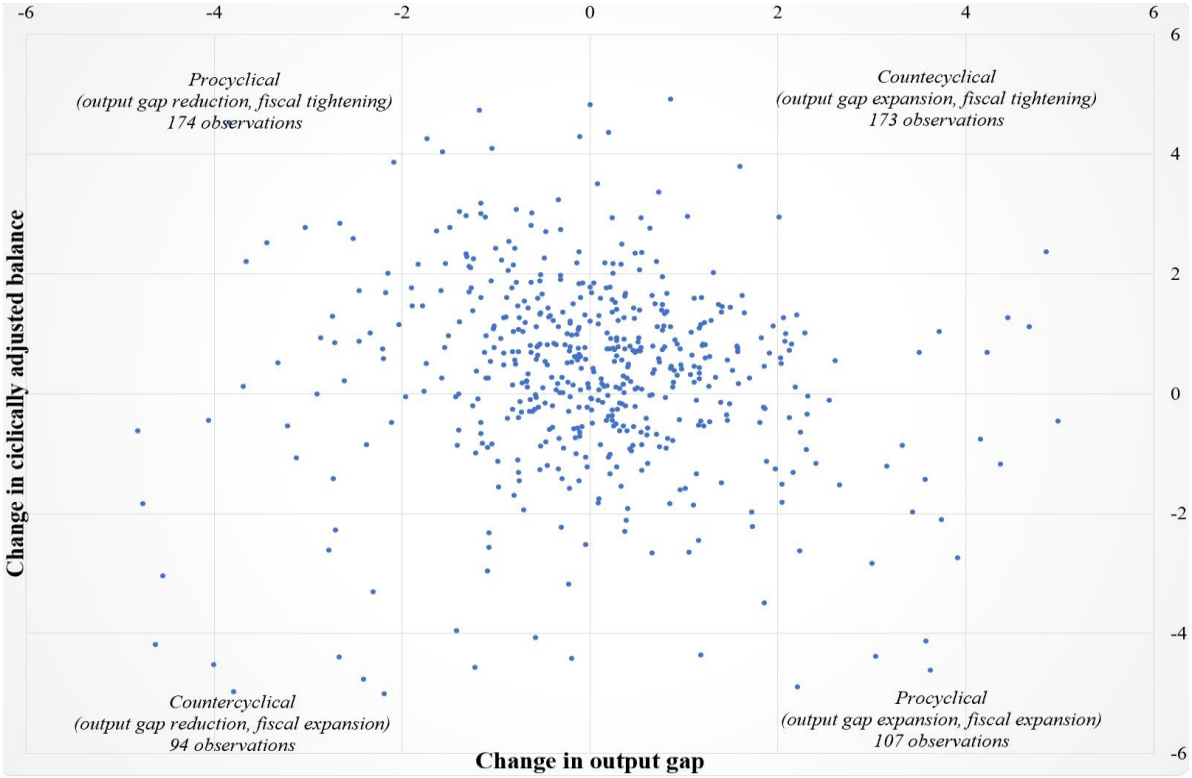
As the first stage of the empirical analysis, variations in output gaps are plotted with changes in cyclically budget balances for the EU sample in the period 1999 to 2019.

Fiscal policy countercyclicality would entail a concentration of the observations in the lower left or upper right quadrants, where the signs of the changes are the same, as opposed to fiscal policy procyclicality, which involves an aggregation of observations in the lower right and upper left quadrants. Fiscal policy acyclicality implies a neither positive nor negative correlation between variables.

In the examined sample, as showed by Figure 3, changes in cyclically adjusted balances are negatively associated with changes in output gaps in more than 50 percent of the observations, suggesting a slightly procyclical reaction of the fiscal impulse to the economic cycle. In these

cases, either discretionary policy was weakened when actual output growth was lower than potential output growth, as in the upper left quadrant, or slackened when actual output growth was higher than its potential, as in the lower right quadrant. The scatterplot does not show a substantial negative correlation since the values of the considered variables may contain measurement errors.

Figure 3: Correlation between changes in cyclically adjusted balances and output gaps



Source: Author's own calculations based on AMECO database
Note: Outlier observations (below -5 and above 5 percent) are omitted to improve the graph visual representation.

Moreover, it is impossible to distinguish between the fiscal policy procyclicality occurred when the budget was planned and the one occurred when it was implemented. Therefore, the graph is not able to explain whether the discretionary policy procyclicality was already clear in the planning stage or if instead it materialized only in the implementation phase. The latter circumstance would manifest, for example, in the case of a countercyclical spending plan implied by an overoptimistic revenue forecast which could switch to procyclical after the outturn is obtained, because of disappointing revenue outcomes and cyclical condition (Eyraud et al., 2017).

6.2 Fiscal policy reaction measured by the change in structural balance

The results of equation (3) presented in Table 3 show that the fiscal impulse is strongly procyclical for the European Union Members in all the analysed settings. Coefficient estimates for the elasticity of structural balance to output gap varies between -0.25 and -0.36, implying that an increase in the change of output gap by 1 percent is correlated with an up to 0.36 percentage points expansion of the structural deficit growth rate. This is to be expected given the robust dependency between the two variables and their parallel fluctuations before and after the economic crisis, confirming the findings of Eyraud et al. (2017) tested on the Euro Area sample and the estimations of Christofzik et al. (2018).

Table 3: Fiscal policy procyclicality in the current framework

	(1)	(2)	(3)	(4)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t+1	Δ(SB/GDP) t|2020
Initial debt/GDP	0.0158***	0.00633	0.0277***	0.0253***
	(4.02)	(1.61)	(5.45)	(6.00)
Δ Output gap	-0.319***	-0.248***	-0.308**	-0.364***
	(-3.76)	(-4.25)	(-3.45)	(-5.86)
Constant	-0.794**	-0.471	-2.091***	-1.876***
	(-3.28)	(-1.85)	(-5.80)	(-6.03)
Observations	433	381	464	558
R^2	0.270	0.156	0.270	0.302
Country FixedEffects	yes	yes	yes	yes
Time FixedEffects	yes	yes	yes	yes

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019)
Note: Estimations rely on the panel ordinary least squared estimator. SB = structural balance.

Surprisingly, the magnitude of the procyclical bias determined from the European Commission forecasts is smaller than the one obtained by governments' budgetary plans, suggesting that the

Commission predicted on average relatively higher structural surpluses during upturns and lower structural deficits during downturns when compared to the legislators' projections.

Comparing the two fiscal policy responses based on the ex-ante estimates to the reaction observed with outturns, the national predictions seem to be more reliable, since the size of the procyclical bias is closer to the one detected using real-time data. However, this sensible difference might possibly be caused by the lower number of Commission forecasts observations. The actual ex-post fiscal impulse shows an even stronger procyclical behaviour of the fiscal rule, supporting the thesis that discretionary policy procyclicality was already indisputable during the planning stage, but not as distinct as after the implementation stage.

Relatively to the factor capturing debt sustainability intended policy response, there is only a marginal evidence of countercyclicality, but it is too small to be considered relevant.

The results are not significantly affected after performing a robustness check that include all the listed control variables, as showed in Table A1 (see Appendix), apart from the Commission forecast column, which shows a less procyclical response.

Moreover, as shown by Table A2 (see Appendix), estimates corroborate the findings of Eyraud et al. (2018) regarding the absence of a causal effect between the post crisis fiscal strengthening and the procyclicality observed over the analysed time interval. Dropping observations from 2011 to 2013, procyclicality becomes stronger, especially in the national plans column, indicating an even weaker fiscal policy reaction to the cycle during the remaining years, probably generated by overoptimistic government projections.

Concerning the test of the asymmetrical discretionary policy response, equation (5) estimates illustrated in Table 4 point to a procyclical bias persistence along the period. Slack policies during upswings have inhibited Members to rebuild fiscal buffers when their economic actual growth was above its potential rate, as forecasted by the Commission and observed ex-post.

Table 4: Asymmetric policy response and deficit bias in the current framework

	(1)	(2)	(3)	(4)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t+1	Δ(SB/GDP) t|2020
Initial debt/GDP	0.0150**	0.00382	0.0279***	0.0201***
	(3.72)	(1.09)	(6.11)	(3.93)
Δ Output gap*D(Δ Output gap > 0)	-0.190	-0.224***	-0.228	-0.295*
	(-1.64)	(-3.82)	(-1.43)	(-2.55)
Δ Output gap*D(Δ Output gap < 0)	-0.484*	-0.107	-0.413*	-0.647**
	(-2.73)	(-1.50)	(-2.64)	(-2.95)
Constant	-0.800**	-0.322	-2.073***	-1.851***
	(-3.26)	(-1.53)	(-6.40)	(-4.50)
Observations	433	382	469	558
R^2	0.283	0.112	0.226	0.194
Country FixedEffects	yes	yes	yes	yes
Time FixedEffects	yes	yes	yes	yes

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019)

Note: Estimations rely on the panel ordinary least squared estimator. SB = structural balance.

This consideration validates the conclusions of Table A2 and is strengthen by the results of Table A3 (see Appendix), which similarly doesn't take into account the 2011 to 2013 consolidation years, showing that both the legislators and the Commission's countries expectations were already conducive to an irresponsible fiscal policy planning during their booming phases. At the same time, a reduced spending capacity and an increased tax collection comported an even more severe procyclicality in the recession period. Similar statements can be asserted when looking at Table A4 (see Appendix), pointing to robust results even when accounting for the entire period.

6.3 Fiscal policy reaction measured by the changes in government budgets and cyclically adjusted government expenditures

The estimates of equation (4) exhibit an acyclical reaction of the fiscal policy to the economic cycle when considering the different government balances growth rates as fiscal impulse

indicators. These outcomes contradict the countercyclical results showed by Egert (2014), who considers the same fiscal variables in levels. A critique which could be moved to the author is that his econometric specification may suffer from unit root non-stationarity, leading to spurious regression estimations.

Conversely, the growth of the cyclically adjusted expenditure aggregate is the only instrument which reacts to the cycle in a countercyclical way, when accounting for both time and country fixed effects. This can be explained by its significant negative association with the output gap variation, verified by the results, implying that a unitary percentage increase in the real economic output growth rate as compared to its potential is correlated to a reduction by 0.2 percent of the change in cyclically adjusted public spending. The finding seems to validate the statement from Christofzik et al. (2018) regarding the revenues higher dependency to the cycle, since the discretionary policy reaction shift from acyclical to countercyclical is verified when the revenue component of the budget is omitted for estimation purposes.

However, as showed by Tables 5 and 6, when time fixed effects are not taken into account (apart from the case of the cyclically adjusted growth rate, which instead includes them), the fiscal policy response seems to turn to countercyclical for the majority of the settings even for the remaining government balances. By neglecting time fixed effects, common shocks which affected all the Members simultaneously over the sample period are ignored, whereas country fixed effects controlling for within country heterogeneity are preserved.

An economic reasoning for the change in the elasticity coefficients significance could be that the estimated cyclical component, considered in the structural balance for the adjustment factor and not included in the measurement of the general government balances, is particularly affected by supranational factors, as opposed to the other budgetary balance components. Evidence of countercyclicality is sensibly stronger in the real-time and ex-post settings, for all

the government balances: during an expansionary phase, an increase in the gap between actual and potential output one percentage unit generates a surplus between 0.3 and 0.4 percent.

Table 5: Fiscal policy countercyclicality using changes in general government budgets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(GGB/GDP) t|t-1	Δ(GGB/GDP) t|t-1	Δ(GGB/GDP) t|t+1	Δ(GGB/GDP) t|2020	Δ(Adj GGB/GDP) t|t-1	Δ(Adj GGB/GDP) t|t-1	Δ(Adj GGB/GDP) t|t+1	Δ(Adj GGB/GDP) t|2020
Initial debt/GDP	0.0119**	0.00700*	0.0358***	0.0333***	0.00276	0.00561	0.0282***	0.0139
	(3.05)	(2.13)	(5.66)	(5.53)	(0.45)	(1.44)	(4.17)	(1.45)
Δ Output gap	0.121	0.102	0.362***	0.358***	0.254***	0.230***	0.381***	0.101
	(1.83)	(1.72)	(7.42)	(8.19)	(3.82)	(6.59)	(9.10)	(1.18)
Constant	-0.254	-0.322	-2.073***	-1.851***	0.292	-0.175	-1.597***	-0.407
	(-1.15)	(-1.73)	(-5.49)	(-5.38)	(0.83)	(-0.78)	(-3.99)	(-0.64)
Observations	431	388	469	558	328	339	401	252
R^2	0.066	0.046	0.191	0.216	0.051	0.170	0.435	0.057
Country FE	yes	yes	yes	yes	yes	yes	yes	yes
Time FE	no	no	no	no	no	no	no	no

t statistics in parentheses
* p<0.05, ** p<0.01, ***p<0.001

Table 6: Fiscal policy countercyclicality using changes in primary balance and cyclically adjusted government expenditures

	(9)	(10)	(11)	(12)	(13)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post	Actual, Ex Post
	Δ(PB/GDP) t|t-1	Δ(PB/GDP) t|t-1	Δ(PB/GDP) t|t+1	Δ(PB/GDP) t|2020	Δ(AdjExp/GDP) t|2020
Initial debt/GDP	0.0124*	0.00780	0.0348***	0.0321***	-0.0320**
	(2.59)	(1.86)	(5.10)	(5.16)	(-2.98)
Δ Output gap	0.210**	0.112	0.337***	0.326***	-0.192**
	(3.24)	(1.79)	(6.85)	(7.31)	(3.09)
Constant	-0.311	-0.399	-2.091***	-1.872***	2.246**
	(-1.12)	(-1.63)	(-5.15)	(-5.26)	(3.07)
Observations	429	374	467	558	558
R^2	0.101	0.040	0.171	0.185	0.117
Country FixedEffects	yes	yes	yes	yes	yes
Time FixedEffects	no	no	no	no	yes

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019)

Note: Estimations rely on the panel ordinary least squared estimator. GGB = general government balance; Adj.GGB = general government balance net one-offs; PB = primary balance; Adj.Exp = cyclically adjusted government expenditures. Results of the regression including both country and time fixed effects for the government budgets growth rates are not reported due to not significant elasticity coefficients.

Planned and forecasted net lending are not always able to detect the fiscal impulse reaction to the cycle, especially in the cases of total general government and primary balances which do

not discount for the impact of discretionary measures. Overall, it can be argued that the countercyclical response of the fiscal impulse, when measured using government fiscal indicators, is undeniable by looking at the realization of the budgetary policies, whereas its predictability is not homogeneous. Indeed, only the impact of the output gap variation on the change in adjusted balance might have been foreseen by both the Commission and policy makers over the analysed period, attesting the efficacy of the instrument as a valid indicator for virtuous fiscal policy planning. Contrarily, the response determined through primary balance growth rates projections captures the countercyclical effect exclusively in the case of national plans, and it is not identified if the change in the general government balance is adopted.

As in the case of the change in the structural balance, the factor controlling for the fiscal policy debt sustainability is overall negligible, even if mainly significant.

Tables A5 and A6 (see Appendix) corroborate these findings: the results obtained operating a robustness check display an even stronger countercyclical response in the case of the adjusted expenditure aggregate growth, even though the predicting power of the change in the adjusted government balance becomes weaker when looking at fiscal policy planning.

Finally, the results of equation (6), reported in Tables 7 and 8, confirms that the change in the adjusted government balance is the best fiscal indicator among the government budget balances, since it is the only one which acts countercyclically both during upturns and downturns.

After including control variables in the regression specification, a more pronounced countercyclicality is delineated by Tables A7 and A8 (see Appendix), especially during downturns, for all government balances. This can be partly explained as the effect of sound fiscal policies implemented by some countries after the crisis to reduce excessive expenditures through spending review programs, as suggested by the reduction of the public sector size when relying on the change of the adjusted general government budget balance.

Table 7: Fiscal policy response along the cycle using changes in general government budgets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(GGB/GDP) t|t-1	Δ(GGB/GDP) t|t-1	Δ(GGB/GDP) t|t+1	Δ(GGB/GDP) t|2020	Δ(Adj GGB/GDP) t|t-1	Δ(Adj GGB/GDP) t|t-1	Δ(Adj GGB/GDP) t|t+1	Δ(Adj GGB/GDP) t|2020
Initial debt/GDP	0.0120**	0.00772	0.0377***	0.0368***	0.00261	0.00676	0.0364***	0.0192*
	(3.04)	(2.79)	(8.34)	(10.12)	(0.43)	(1.70)	(7.44)	(2.57)
Δ Output gap*	0.186	0.0190	0.661	0.648	0.307*	0.225**	0.559***	0.390**
D(Δ Output gap>0)	(1.28)	(0.24)	(1.31)	(1.42)	(2.11)	(3.18)	(6.11)	(3.10)
Δ Output gap*	0.0366	0.277***	-0.0689	0.190	0.154	0.266**	0.120	-0.0818
D(Δ Output gap<0)	(0.48)	(4.05)	(-0.25)	(0.85)	(-2.73)	(3.57)	(0.48)	(-0.19)
Constant	-0.320	-0.278	-2.404***	-2.198***	0.260	-0.228	-2.261***	-0.954
	(-1.55)	(-1.77)	(-8.18)	(-10.22)	(0.75)	(-1.05)	(-7.26)	(-1.83)
Observations	465	402	497	558	329	339	402	252
R^2	0.075	0.055	0.083	0.115	0.052	0.162	0.150	0.088
Country FE	yes	yes	yes	yes	yes	yes	yes	yes
Time FE	no	no	no	no	no	no	no	no

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 8: Fiscal policy response along the cycle using changes in primary balance and cyclically adjusted government expenditures

	(9)	(10)	(11)	(12)	(13)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post	Actual, Ex Post
	Δ(PB/GDP) t|t-1	Δ(PB/GDP) t|t-1	Δ(PB/GDP) t|t+1	Δ(PB/GDP) t|2020	Δ(AdjExp/GDP) t|2020
Initial debt/GDP	0.0122*	0.00963*	0.0369***	0.0338***	-0.0279**
	(2.47)	(2.61)	(8.39)	(9.26)	(-3.35)
Δ Output gap*D(Δ Output gap> 0)	0.329*	0.0831	0.803	0.754	-0.105
	(2.16)	(0.72)	(1.55)	(1.57)	(-2.23)
Δ Output gap*D(Δ Output gap< 0)	0.0598	0.229*	-0.204	0.0774	0.416
	(0.60)	(2.46)	(-0.78)	(0.35)	(1.78)
Constant	-0.398	-0.449*	-2.535***	-2.166***	2.071**
	(-1.45)	(-2.08)	(-8.54)	(-10.02)	(2.99)
Observations	451	387	495	558	558
R^2	0.113	0.052	0.089	0.109	0.102
Country FixedEffects	yes	yes	yes	yes	yes
Time FixedEffects	no	no	no	no	yes

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019)

Note: Estimations rely on the panel ordinary least squared estimator. GGB = general government balance; Adj.GGB = general government balance net one-offs; PB = primary balance; Adj.Exp = cyclically adjusted government expenditures. Results of the regression including both country and time fixed effects for the government budgets growth rates are not reported due to not significant elasticity coefficients.

7. Conclusion

The paper confirms that the drawbacks of the current EU fiscal framework led to two major outcomes in the last 20 years: fiscal rules compliance deficiency and failure in achievement of

discretionary policy countercyclicality. In the Euro Area, from 2011 to 2018, the current fiscal framework observed a non-compliance rate above two-thirds (98 out of 144 observations). Moreover, using data for the EU from 1999 to 2019, we show a clear procyclical behaviour of the current key fiscal impulse indicator, the change in structural balance, in particular when relying on ex-post data (i.e. the *actual* fiscal stance vis-à-vis the *planned* fiscal stance).

Our analysis presents a feasible solution to overcome these problems by providing evidence of the beneficial effects of using the expenditure rule proposed by Ducoudré et al.(2018). In fact, the employment of an alternative fiscal indicator - the cyclically adjusted expenditures growth rate - ensures a countercyclical response is empirically activated. However, when the fiscal policy reaction is measured by the changes in government balances (unadjusted and adjusted general government balances, primary balance), this result only holds if one does not control for symmetric shocks. Accounting for them renders these indicators irresponsive to the cycle, which means that symmetric shocks (like COVID-19) need a supranational mechanism able at least to coordinate the response and ensure effective countercyclical action.

Our final result is that the new expenditure rule would have been binding in 72 percent of the analysed years (61 in the Euro Area), especially during the expansion periods before and after the crisis. This implies a different behaviour of the fiscal stance would have been triggered with the proposed rule in place, changing the course of EU fiscal history. However, the argument can be valid only if the new rule's compliance levels would have been higher than the MTO ones. While that is an important avenue of future research, the fact that the proposal is both simpler and more transparent suggests that the new expenditure rule would have been easier to enforce. Another possible investigation is the study of debt sustainability patterns arising from the new rule. A fully-fledged model would allow a debt path simulation, which is an important element to thoroughly assess the merits of the new proposal. Finally, there are political economy considerations that need to be examined, beyond the economic issues discussed above.

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Appendix

Table A1: Fiscal policy procyclicality in the current framework including controls

	(1)	(2)	(3)	(4)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t+1	Δ(SB/GDP) t|2020
Initial debt/GDP	0.000894	-0.00166	0.0179*	0.0204***
	(0.14)	(-0.21)	(2.48)	(3.90)
Δ Output gap	-0.313**	-0.194**	-0.288*	-0.385***
	(-3.49)	(-2.96)	(-2.24)	(-5.83)
Population growth	-0.352	-0.113	-0.151	-0.0251
	(-2.74)	(-1.27)	(-0.92)	(-0.18)
Debt servicing	0.207	0.114	-0.000363	0.0117
	(1.59)	(1.02)	(-0.00)	(0.13)
Openness	-0.00764	-0.00727**	0.00344	0.00531
	(-1.93)	(-2.88)	(0.46)	(1.37)
Inflation growth	0.000769	0.0108	-0.0528	-0.0212
	(0.09)	(1.24)	(-1.85)	(-1.39)
Real GDP growth	0.0219	-0.0240	0.0439	-0.00849
	(0.86)	(-1.68)	(0.94)	(-0.24)
Public sector size	0.00509	-0.108*	-0.160*	-0.123
	(0.11)	(-2.60)	(-2.11)	(-1.98)
Public investment	0.00227	-0.0556	-0.183	-0.237*
	(0.04)	(-1.06)	(-1.65)	(-2.36)
Real house price growth	-0.00859	0.00343	-0.00969	0.00597
	(-1.81)	(0.59)	(-0.73)	(0.49)
Constant	0.884	3.304*	1.863	1.004
	(0.71)	(2.75)	(0.88)	(0.59)
Observations	394	352	418	460
R^2	0.343	0.196	0.292	0.403
Country FixedEffects	yes	yes	yes	yes
Time FixedEffects	yes	yes	yes	yes

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019), Eurostat (for Openness, Real GDP growth and Public investment)

Note: Estimations rely on the panel ordinary least squared estimator. SB = structural balance.

Table A2: Fiscal policy procyclicality in the current framework excluding periods of fiscal consolidation during the crisis

	(1)	(2)	(3)	(4)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t+1	Δ(SB/GDP) t|2020
Initial debt/GDP	0.0169**	0.00531	0.0241***	0.0228***
	(3.19)	(1.08)	(4.06)	(4.71)
Δ Output gap	-0.435***	-0.295***	-0.324**	-0.369***
	(-4.64)	(-4.07)	(-3.64)	(-5.49)
Constant	-0.859*	-0.390	-1.863***	-1.709***
	(-2.55)	(-1.23)	(-4.52)	(-5.34)
Observations	354	305	390	474
R^2	0.280	0.130	0.255	0.236
Country FixedEffects	yes	yes	yes	yes
Time FixedEffects	yes	yes	yes	yes

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019)
Note: Observations from 2011 to 2013 are excluded. Estimations rely on the panel ordinary least squared estimator. SB = structural balance.

Table A3: Asymmetric policy response and deficit bias in the current framework excluding periods of fiscal consolidation during the crisis

	(1)	(2)	(3)	(4)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t+1	Δ(SB/GDP) t|2020
Initial debt/GDP	0.0165**	0.00249	0.0240***	0.0159***
	(2.89)	(0.59)	(4.40)	(2.78)
Δ Output gap*D(Δ Output gap> 0)	-0.367**	-0.272***	-0.276	-0.151
	(-3.26)	(-3.10)	(-1.21)	(-0.80)
Δ Output gap*D(Δ Output gap<0)	-0.478**	-0.102	-0.449**	-0.647**
	(-3.18)	(-1.46)	(-3.02)	(-2.90)
Constant	-0.855*	-0.237	-1.900***	-1.318***
	(-2.45)	(-0.89)	(-4.96)	(-3.82)
Observations	354	306	395	474
R^2	0.282	0.079	0.205	0.128
Country FixedEffects	yes	yes	yes	yes
Time FixedEffects	yes	yes	yes	yes

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019)
Note: Observations from 2011 to 2013 are excluded. Estimations rely on the panel ordinary least squared estimator. SB = structural balance.

Table A4: Asymmetric policy response and deficit bias in the current framework including controls

	(1)	(2)	(3)	(4)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t-1	Δ(SB/GDP) t|t+1	Δ(SB/GDP) t|2020
Initial debt/GDP	-0.000113	-0.00153	0.0188*	0.0210***
	(-0.02)	(-0.20)	(2.45)	(4.14)
Δ Output gap*D(Δ Output gap > 0)	-0.225	-0.202**	-0.351*	-0.422***
	(-1.73)	(-3.20)	(-2.34)	(-4.77)
Δ Output gap*D(Δ Output gap < 0)	-0.441**	-0.179	-0.246	-0.362***
	(-3.04)	(-1.68)	(-1.83)	(-4.08)
Population growth	-0.317**	-0.117	-0.189	-0.0352
	(-2.92)	(-1.21)	(-1.02)	(-0.23)
Debt servicing	0.231	0.112	-0.00920	0.00744
	(1.73)	(1.01)	(-0.06)	(0.09)
Openness	-0.00707	-0.00742**	0.00300	0.00530
	(-1.89)	(-2.95)	(0.39)	(1.33)
Inflation growth	-0.000720	0.0108	-0.0476	-0.0202
	(-0.08)	(1.23)	(-1.50)	(-1.37)
Real GDP growth	0.0241	-0.0240	0.0403	-0.00916
	(0.94)	(-1.69)	(0.88)	(-0.26)
Public sector size	0.00976	-0.108*	-0.177*	-0.126
	(0.21)	(-2.57)	(-2.26)	(-2.00)
Public investment	-0.00527	-0.0546	-0.184	-0.234*
	(-0.08)	(-1.03)	(-1.72)	(-2.30)
Real house price growth	-0.00702	0.00326	-0.0110	0.00543
	(-1.45)	(0.52)	(-0.81)	(0.45)
Constant	0.711	3.338*	2.242	1.030
	(0.59)	(2.72)	(1.02)	(0.60)
Observations	394	353	420	460
R^2	0.349	0.196	0.306	0.403
Country FixedEffects	yes	yes	yes	yes
Time FixedEffects	yes	yes	yes	yes

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019), Eurostat (for Openness, Real GDP growth and Public investment)
Note: Estimations rely on the panel ordinary least squared estimator. SB = structural balance.

Table A5: Fiscal policy countercyclicality using changes in general government budgets and including controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(GGB/GDP) t|t-1	Δ(GGB/GDP) t|t-1	Δ(GGB/GDP) t|t+1	Δ(GGB/GDP) t|2020	Δ(Adj GGB/GDP) t|t-1	Δ(Adj GGB/GDP) t|t-1	Δ(Adj GGB/GDP) t|t+1	Δ(Adj GGB/GDP) t|2020
Initial debt/GDP	0.0111*	0.0123**	0.0289**	0.0280*	0.00999*	0.00904	0.0234*	0.0217
	(2.17)	(3.29)	(2.85)	(2.54)	(2.11)	(1.74)	(2.24)	(1.96)
Δ Output gap	0.111	0.134	0.340***	0.444***	0.183*	0.138	0.351***	0.487***
	(1.53)	(1.98)	(5.48)	(6.51)	(2.44)	(1.91)	(5.01)	(7.28)
Population growth	-0.0546	0.156	0.235	0.345	-0.150	0.140	0.136	0.286
	(-0.41)	(1.55)	(1.07)	(1.88)	(-1.13)	(1.22)	(0.66)	(1.49)
Debt servicing	0.221	0.0775	0.124	0.222	0.296	0.326*	0.256	0.315
	(1.72)	(0.72)	(0.82)	(1.58)	(1.98)	(2.08)	(1.35)	(1.99)
Openness	-0.00247	-0.00669**	-0.0102	-0.00433	-0.00106	-0.00461	-0.00985	-0.00243
	(-0.75)	(-3.47)	(-0.95)	(-0.69)	(-0.34)	(-1.78)	(-0.92)	(-0.35)
Inflation growth	0.0169	0.0223**	0.0205	0.0453	0.0250*	0.0250*	0.0155	0.0453
	(1.76)	(3.11)	(0.37)	(1.02)	(2.63)	(2.25)	(0.32)	(1.02)
Real GDP growth	0.0142	-0.0299*	0.101	-0.0664	0.0150	-0.0230	0.0897	-0.113*
	(0.94)	(-2.63)	(1.23)	(-1.41)	(0.86)	(-1.94)	(1.06)	(-2.39)
Public sector size	0.0364	-0.0631	-0.0589	-0.160	0.137*	-0.00571	-0.0344	-0.120
	(0.58)	(-1.44)	(-0.43)	(-1.94)	(2.43)	(-0.10)	(-0.29)	(-1.45)
Public investment	0.0444	0.00453	-0.456	-0.454*	0.0435	0.0288	-0.423	-0.446*
	(0.54)	(0.08)	(-1.92)	(-2.56)	(0.50)	(0.43)	(-1.70)	(-2.43)
Real house price growth	-0.0107	0.00488	-0.0422*	-0.0164	-0.00622	0.00540	-0.0489**	-0.0200
	(-1.56)	(0.83)	(-2.75)	(-1.03)	(-0.63)	(0.71)	(-3.23)	(-1.11)
Constant	-1.274	1.210	1.899	3.235	-3.572*	-0.636	1.312	2.383
	(-0.95)	(1.32)	(0.60)	(1.75)	(-2.51)	(-0.54)	(0.46)	(1.28)
Observations	392	358	422	460	392	343	420	460
R^2	0.112	0.084	0.220	0.264	0.190	0.085	0.200	0.232
Country FE	yes	yes	yes	yes	yes	yes	yes	yes
Time FE	no	no	no	no	no	no	no	no

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019), Eurostat (for Openness, Real GDP growth and Public investment)
Note: Estimations rely on the panel ordinary least squared estimator. GGB = general government balance; Adj.GGB = general government balance net one-offs. Results of the regression including both country and time fixed effects for the government budgets growth rates are not reported due to not significant elasticity coefficients.

Table A6: Fiscal policy countercyclicality using changes in primary balance and cyclically adjusted government expenditures, including controls

	(9)	(10)	(11)	(12)	(13)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post	Actual, Ex Post
	Δ(PB/GDP) t|t-1	Δ(PB/GDP) t|t-1	Δ(PB/GDP) t|t+1	Δ(PB/GDP) t|2020	Δ(AdjExp/GDP) t|2020
Initial debt/GDP	-0.00730	0.00730	0.0134	-0.00654	-0.0189
	(-1.36)	(1.73)	(1.85)	(-0.67)	(-1.30)
Δ Output gap	0.174	0.261***	0.318***	0.162	0.302
	(2.02)	(5.62)	(7.69)	(2.05)	(2.56)
Population growth	-0.0710	-0.00744	-0.138	-0.642***	-0.453*
	(-0.38)	(-0.08)	(-0.78)	(-3.88)	(-2.49)
Debt servicing	0.481*	0.146	0.268	0.403**	-0.333*
	(2.48)	(1.76)	(1.47)	(2.99)	(-2.23)
Openness	0.00742	-0.00554*	0.00269	-0.0189**	0.00376
	(1.16)	(-2.25)	(0.41)	(-3.48)	(0.78)
Inflation growth	0.0468	0.0253*	0.0210	-0.00582	-0.0190
	(1.75)	(2.31)	(0.67)	(-0.15)	(-0.42)
Real GDP growth	0.00135	-0.0398***	0.104**	0.000594	-0.183**
	(0.06)	(-3.74)	(2.87)	(0.01)	(-3.08)
Public sector size	0.0470	-0.129***	-0.184	-0.350**	0.0757
	(0.73)	(-3.92)	(-1.80)	(-3.16)	(1.15)
Public investment	-0.0917	0.0336	-0.261	-0.0835	0.504**
	(-1.42)	(0.71)	(-2.05)	(-0.67)	(3.21)
Real house price growth	-0.0105	-0.000934	-0.0343**	-0.0313*	0.0434**
	(-1.17)	(-0.17)	(-3.42)	(-2.11)	(2.89)
Constant	-1.675	2.591**	2.909	10.03***	-1.290
	(-0.84)	(3.32)	(1.30)	(4.04)	(-0.65)
Observations	298	311	361	222	460
R^2	0.147	0.253	0.512	0.220	0.168
Country FixedEffects	yes	yes	yes	yes	yes
Time FixedEffects	no	no	no	no	yes

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019), Eurostat (for Openness, Real GDP growth and Public investment)

Note: Estimations rely on the panel ordinary least squared estimator. PB = primary balance; Adj.Exp = cyclically adjusted government expenditures. Results of the regression including both country and time fixed effects for the government budgets growth rates are not reported due to not significant elasticity coefficients.

Table A7: Fiscal policy response along the cycle using changes in general government budgets and including controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post
	Δ(GGB/GDP) t|t-1	Δ(GGB/GDP) t|t-1	Δ(GGB/GDP) t|t+1	Δ(GGB/GDP) t|2020	Δ(Adj GGB/GDP) t|t-1	Δ(Adj GGB/GDP) t|t-1	Δ(Adj GGB/GDP) t|t+1	Δ(Adj GGB/GDP) t|2020
Initial debt/GDP	0.0118*	0.0138***	0.0295**	0.0288*	-0.00699	0.00719	0.0147*	-0.00184
	(2.28)	(3.91)	(3.00)	(2.55)	(-1.31)	(1.72)	(2.41)	(-0.16)
Δ Output gap*D (Δ Output gap > 0)	0.115	0.0185	0.231	0.275	0.178	0.272**	0.0329	0.234
	(0.82)	(0.18)	(1.94)	(1.57)	(1.34)	(3.57)	(0.36)	(1.71)
Δ Output gap*D (Δ Output gap < 0)	0.0993	0.288**	0.381***	0.519***	0.169	0.247**	0.435***	0.0235
	(1.19)	(3.01)	(4.84)	(7.60)	(1.24)	(2.93)	(6.02)	(0.13)
Population growth	-0.0639	0.116	0.137	0.275	-0.0727	-0.00324	-0.405*	-0.624**
	(-0.50)	(1.06)	(0.47)	(1.62)	(-0.39)	(-0.03)	(-2.25)	(-3.47)
Debt servicing	0.179	0.0846	0.0566	0.215	0.472*	0.146	0.0839	0.279
	(1.65)	(0.78)	(0.38)	(1.54)	(2.46)	(1.76)	(0.44)	(1.43)
Openness	-0.00155	-0.00887***	-0.0104	-0.00489	0.00727	-0.00548*	-0.00390	-0.0190**
	(-0.52)	(-4.90)	(-0.99)	(-0.75)	(1.14)	(-2.30)	(-0.59)	(-3.52)
Inflation growth	0.0160	0.0229**	0.0243	0.0470	0.0467	0.0252*	0.0343	-0.0118
	(1.80)	(3.28)	(0.49)	(1.07)	(1.74)	(2.30)	(1.23)	(-0.30)
Real GDP growth	0.0143	-0.0237*	0.0965	-0.0701	0.00152	-0.0402***	0.102*	-0.00217
	(0.92)	(-2.15)	(1.30)	(-1.48)	(0.07)	(-4.09)	(2.17)	(-0.04)
Public sector size	0.0581	-0.0574	-0.108	-0.160	0.0484	-0.129***	-0.304**	-0.342**
	(0.97)	(-1.33)	(-1.06)	(-2.00)	(0.75)	(-3.92)	(-2.87)	(-2.97)
Public investment	0.0346	0.00197	-0.466	-0.420*	-0.0907	0.0324	-0.222	-0.0733
	(0.43)	(0.04)	(-1.85)	(-2.42)	(-1.39)	(0.69)	(-1.70)	(-0.61)
Real house price growth	-0.0101	0.00251	-0.0448**	-0.0175	"-0.0105"	-0.000553	-0.0437***	-0.0337*
	(-1.49)	(0.45)	(-3.01)	(-1.08)	(-1.20)	(-0.09)	(-3.77)	(-2.11)
Constant	-1.765	1.382	3.190	3.371	-1.696	2.584**	6.691**	9.696***
	(-1.40)	(1.56)	(1.25)	(1.79)	(-0.85)	(3.28)	(2.78)	(3.80)
Observations	416	368	435	460	299	311	362	222
R^2	0.113	0.101	0.223	0.269	0.146	0.253	0.531	0.228
Country FE	yes	yes	yes	yes	yes	yes	yes	yes
Time FE	no	no	no	no	no	no	no	no

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019), Eurostat (for Openness, Real GDP growth and Public investment)

Note: Estimations rely on the panel ordinary least squared estimator. GGB = general government balance; Adj.GGB = general government balance net one-offs. Results of the regression including both country and time fixed effects for the government budgets growth rates are not reported due to not significant elasticity coefficients.

Table A8: Fiscal policy response along the cycle using changes in primary balance and cyclically adjusted government expenditures, including controls

	(9)	(10)	(11)	(12)	(13)
	Plans	EC Forecast	Actual, Real Time	Actual, Ex Post	Actual, Ex Post
	Δ(PB/GDP) t|t-1	Δ(PB/GDP) t|t-1	Δ(PB/GDP) t|t+1	Δ(PB/GDP) t|2020	Δ(AdjExp/GDP) t|2020
Initial debt/GDP	0.0108*	0.0154**	0.0245*	0.0225	-0.0198
	(2.30)	(2.82)	(2.38)	(1.98)	(-1.16)
Δ Output gap* D(Δ Output gap > 0)	0215	0.00174	0.243	0.325	0.350
	(1.43)	(0.01)	(2.00)	(1.80)	(1.31)
Δ Output gap* D(Δ Output gap <0)	0.143	0.318**	0.391***	0.558***	-0.271*
	(1.46)	(2.93)	(4.72)	(7.72)	(2.64)
Population growth	-0.145	0.0652	0.0396	0.220	-0.440*
	(-1.08)	(0.51)	(0.15)	(1.18)	(-2.53)
Debt servicing	0.253	0.237	0.170	0.308	-0.327
	(1.94)	(1.50)	(0.96)	(1.96)	(-2.02)
Openness	-0.000721	-0.00961*	-0.0106	-0.00297	0.00377
	(-0.26)	(-2.65)	(-1.01)	(-0.42)	(0.78)
Inflation growth	0.0243*	0.0249*	0.0197	0.0469	-0.0205
	(2.64)	(2.25)	(0.43)	(1.07)	(-0.42)
Real GDP growth	0.0132	-0.0197	0.0886	-0.117*	-0.182**
	(0.74)	(-1.57)	(1.06)	(-2.45)	(-3.18)
Public sector size	0.153*	-0.0119	-0.0657	-0.120	0.0799
	(2.76)	(-0.21)	(-0.59)	(-1.49)	(1.14)
Public investment	0.0301	0	0	0	0.500**
	(0.35)	(.)	(.)	(.)	(3.18)
Real house price growth	-0.00542	0.00200	-0.0524**	-0.0211	0.0441*
	(-0.56)	(0.30)	(-3.44)	(-1.16)	(2.66)
Constant	-3.875**	0.0398	2.348	2.513	-1.325
	(-2.81)	(0.03)	(0.96)	(1.32)	(-0.67)
Observations	409	352	429	460	460
R^2	0.194	0.104	0.204	0.237	0.168
Country FixedEffects	yes	yes	yes	yes	yes
Time FixedEffects	no	no	no	no	yes

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: AMECO database (for t|2020 variables), AMECO old vintages (for t|t+1 variables from 2010 to 2019), Stability and Convergence Programs and Commission Staff Working Documents (for t|t+1 variables from 1999 to 2009 and t|t-1 variables from 1999 to 2019), Eurostat (for Openness, Real GDP growth and Public investment)

Note: Estimations rely on the panel ordinary least squared estimator. PB = primary balance; Adj.Exp = cyclically adjusted government expenditures. Results of the regression including both country and time fixed effects for the government budgets growth rates are not reported due to not significant elasticity coefficients.